Air Force Institute for Operational Health

Level I Ergonomic Evaluation Software for Palm OS based handheld

Developed and written by:

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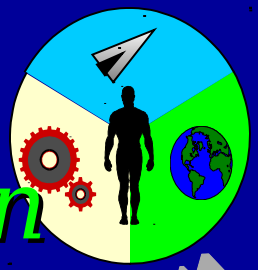
Tools And Resources

Level I Handheld Application



- Extremely portable
- Easy to use: tap, touch, select
- Avoid use of paper
  - ✓ Data captured one-time (on-site)
  - ✓ Hotsync to desktop applications - eliminates transcription errors
  - ✓ Reference tools can be incorporated into application
- Results can be calculated immediately after data collection is

Tools and Resources

Level I Handheld Application

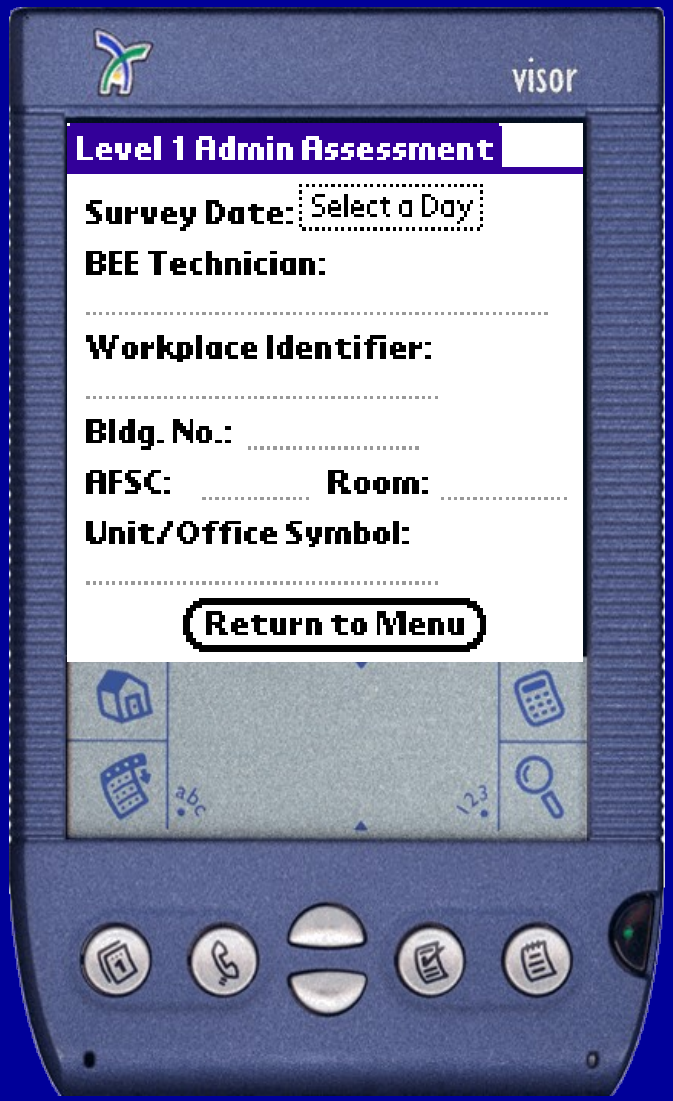
Palm OS-based application

Users have choice of two checklists:

- Checklist for Administrative Areas
- Checklist for Maintenance/Service

Tools and Resources

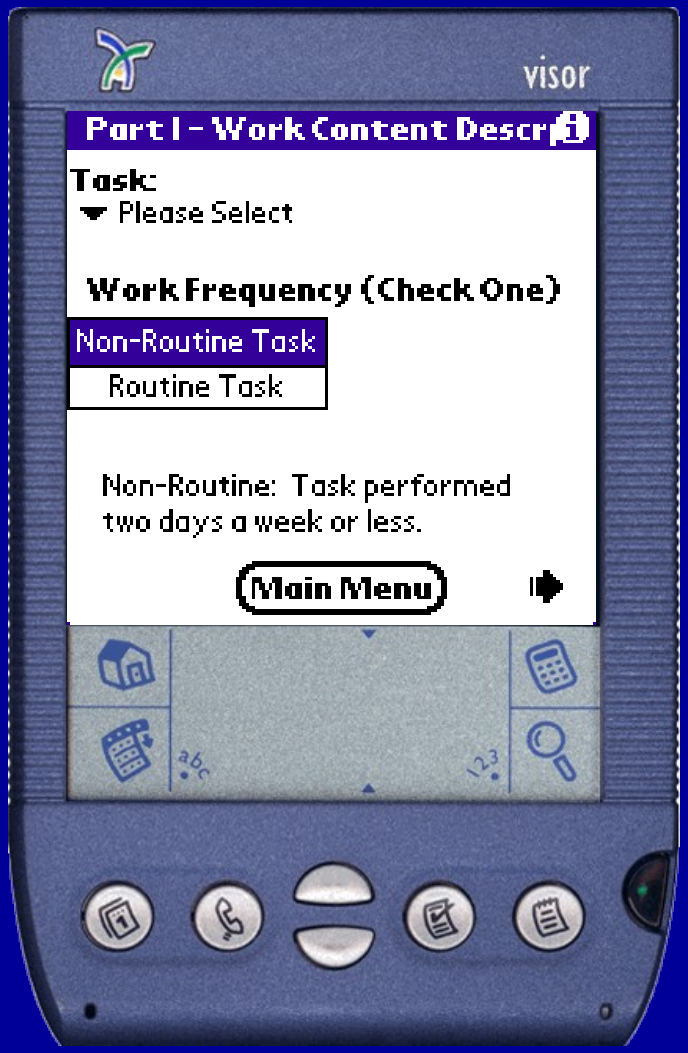
Level I Handheld Application



Step 1: Enter demographic information for shop being evaluated

Tools and Resources

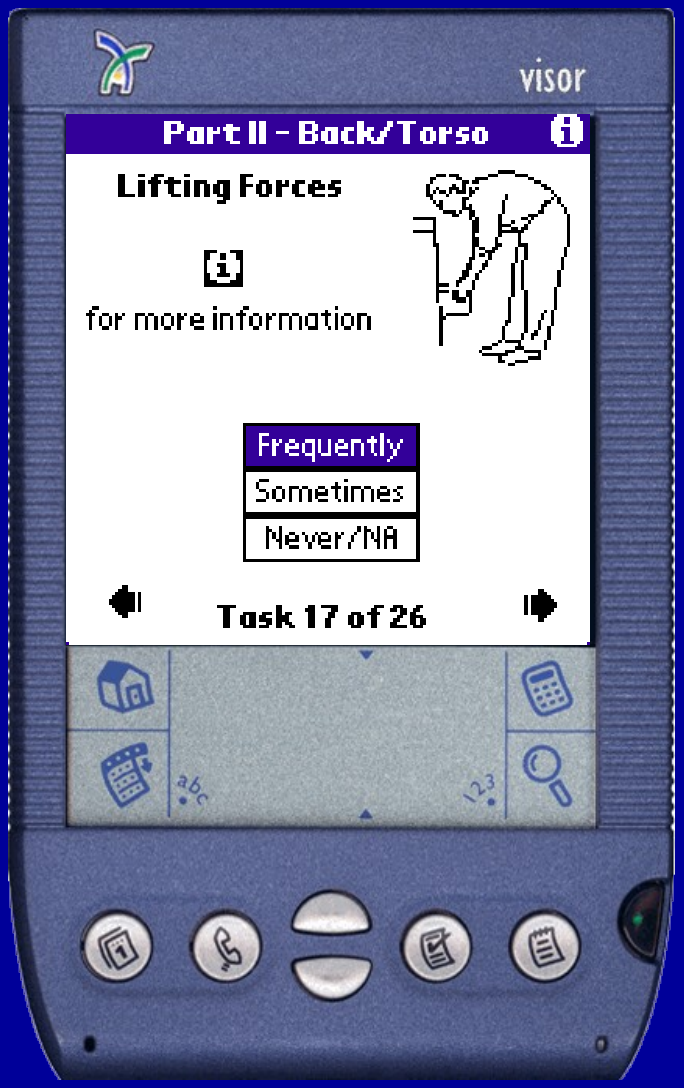
Level I Handheld Application



Step 2:
Select the task to be evaluated, and the frequency and duration of task performance

Tools and Resources

Level I Handheld Application



Step 3: Select/evaluate ergonomic hazards associated with the task

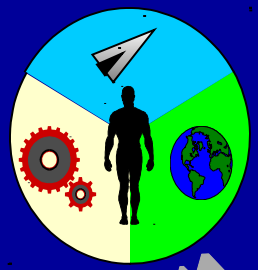
Signifies additional information (tips)

Tools and Resources

Level I Handheld Application

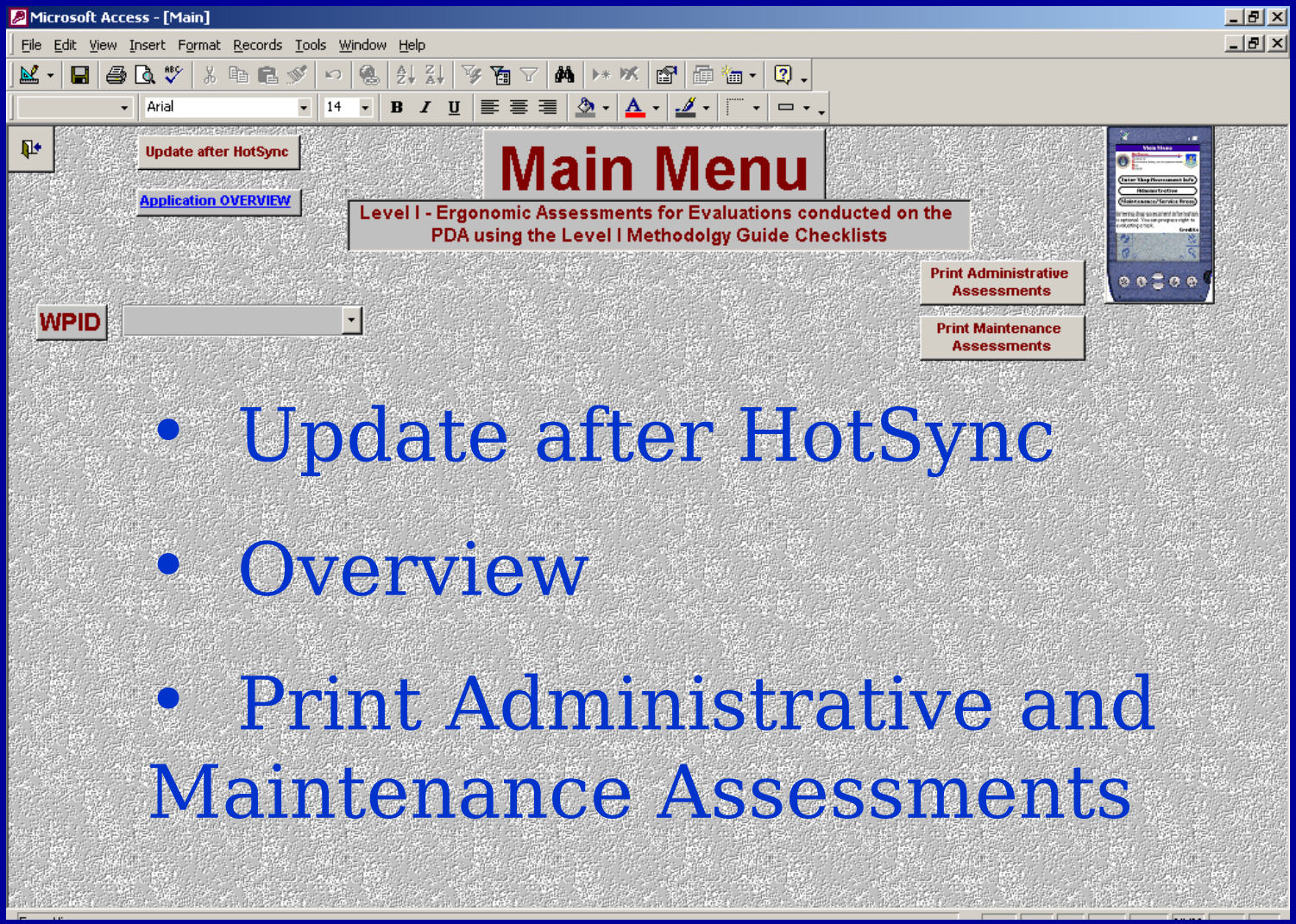
Application assigns scores/ratings to task based on the number of ergonomic hazards identified (broken out by body region

Additional Features



- Conduit between handheld and desktop; transfer evaluations during HotSync
- Access 2000 database desktop application
  - ✓ Imports data transferred from HotSync
  - ✓ Allows selection of multiple tasks for single job

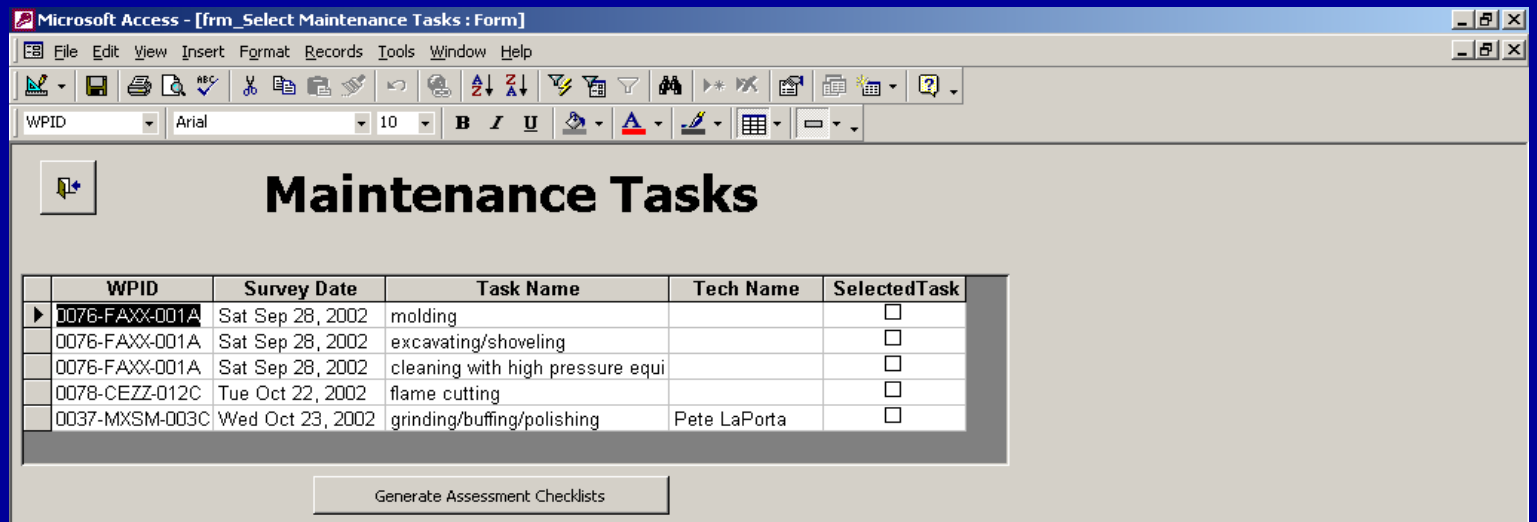
Desktop Application
Overview


Microsoft Access - [Main]
File Edit View Insert Format Records Tools Window Help
Arial
14
Update after HotSync
Application OVERVIEW
Main Menu
Level I - Ergonomic Assessments for Evaluations conducted on the PDA using the Level I Methodolgy Guide Checklists
Print Administrative Assessments
Print Maintenance Assessments
WPID

- Update after HotSync
- Overview
- Print Administrative and Maintenance Assessments

Desktop Application

Hardcopy Assessments



- Select tasks you want to print
- Only prints individual assessments
- Separate for

Desktop Application
Hardcopy Assessments

Level I - Ergonomics Assessment for Maintenance, Warehouse, and Service Work Areas

Task Name	welding	Bldg Number	
Survey Date	Sat Sep 28, 2002	AFSC	
Tech Name		Room Number	
WRD	0076-5AXX-001A	Unit/Office Symbol	

Part II - Checklist, Shoulder / Neck

	Task Frequency High 51-100%	
1.1 Repeated reaching or arm held away from the body while unsupported:		
Elbow/shoulder level (>30-90 degrees away) or bent	1	S
1.2 Repeated arm forces exceeding 10 lbs. (4.6 kg.) (e.g. roughly equivalent to lifting a gallon of milk)	0	N
1.3 Holding/carrying material exceeding 25 lbs. (11.3kg.)	0	N
1.4 Head/neck bent, tilted, or twisted (e.g., display too high or too far away)	0	N
1.7 High speed, sudden shoulder movements (e.g., opening a stuck door, pulling and yanking on a bed linen to remove them)	0	N
Task Scores = (column total)	1	

Part II - Checklist, Hand/Wrist/Arm

2.1 Bent wrists (>10 degrees in any direction)	1	S
2.2 Repeated hand, wrist, or arm movements (include forearm rotation) (e.g., scanning groceries, washing dishes)	1	S
2.3 Repeated finger movements (e.g., repetitive keying tasks, operating button on hand-held scanners)	1	S
2.4 Hyperextension of thumb/finger (e.g., using pliers with a wide handle span; using a small input device)	1	S
2.6 Hand forces; fingertip force >2 lbs.(.9 kg.) (e.g., 2 lbs. is roughly equal to holding fingernail clippers closed) or full hand force >8 lbs. (3.6 kg.) (e.g., 8 lbs. is roughly equal to holding a gallon of milk)	1	S
2.8 Hard edges (e.g., tool handle or work area presses in to fingers or hand, holding box by outside handle or strapping)	1	S
2.7 Exposure to hand-transmitted vibration, impact forces, or torque (e.g., using a nail gun)	1	S
2.8 Hand/fingers exposed to cold temperatures (e.g., working outside in winter environment, working in freezers, meat packing)	0	N
Task Scores = (column total)	7	

Part II - Checklist, Back/Torso

3.1 Static/awkward back postures while standing or sitting (e.g., leaning forward or to the side >20 degrees)	0	N
3.2 Repeated forward or sideways bending (>20 degrees) (e.g. lifting from floor level)	0	N
3.3 Repeated twisting (e.g. reaching while lifting, pulling, open a stuck door)	0	N
3.4 Lifting 50 lbs. (22.7 kg.) if upright with the load held close to the body or 10 lbs. (4.6 kg.) if lifting involves bending or reaching	0	N
3.6 High speed or sudden movements (e.g., lifting patients, lifting boxes larger than 30 in (76 cm))	0	N
3.8 Pushing/pulling > 50 lbs. (22.7 kg.) (e.g. pushing/pulling a full two-drawer file cabinet across a carpeted floor)	0	N
3.7 No foot support when seated	0	N
3.8 Exposure to whole body vibration (e.g. operating a fork lift truck)	1	S
Task Scores = (column total)	1	

Part II - Checklist, Legs/Feet

4.1 Standing in a fixed position (especially on hard floor surface)	1	S
4.2 Exposure to hard edges or surfaces (e.g., edge of chair presses into backs of legs, task requires leaning against the hard edge of a table	1	S
4.3 Awkward leg postures (e.g. kneeling, squatting, crawling, etc.)	0	N
4.4 Use of foot pedal while standing	0	N
Task Scores = (column total)	2	

Part II - Checklist, Head/Eyes

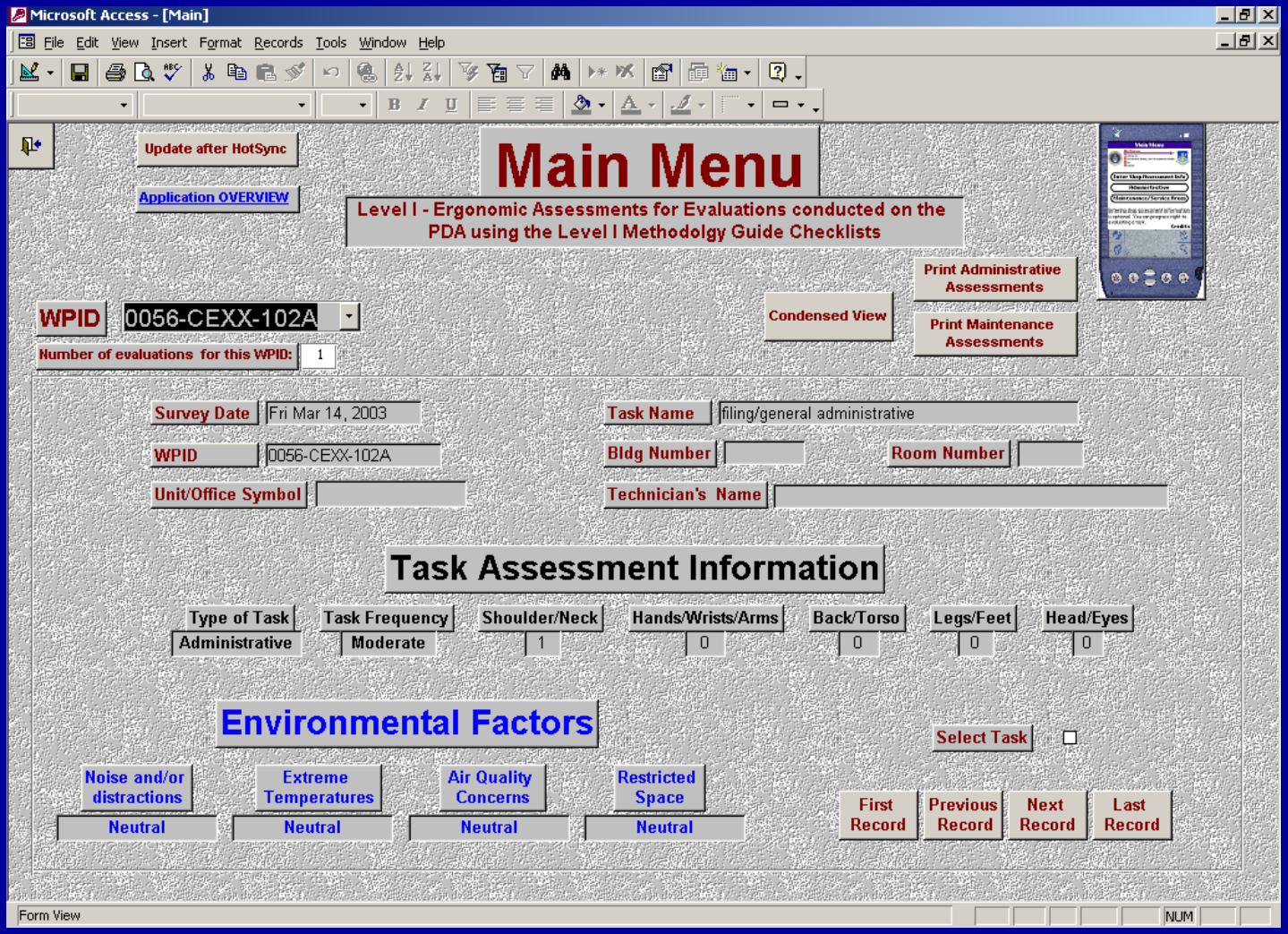
6.1 Lighting levels are too high or too low (difficult to see)	0	N
6.2 Task is visually demanding (e.g., requires close examination of work piece or computer screen)	0	N
6.3 Glare is present on the work surface or computer screen	0	N
Task Scores = (column total)	0	

Part III - Environmental

1. Noise and/or distractions	Strongly Disagree	3. Air quality concerns	Agree
2. Extreme temperatures hot/cold	Strongly Agree	4. Restricted space	Disagree

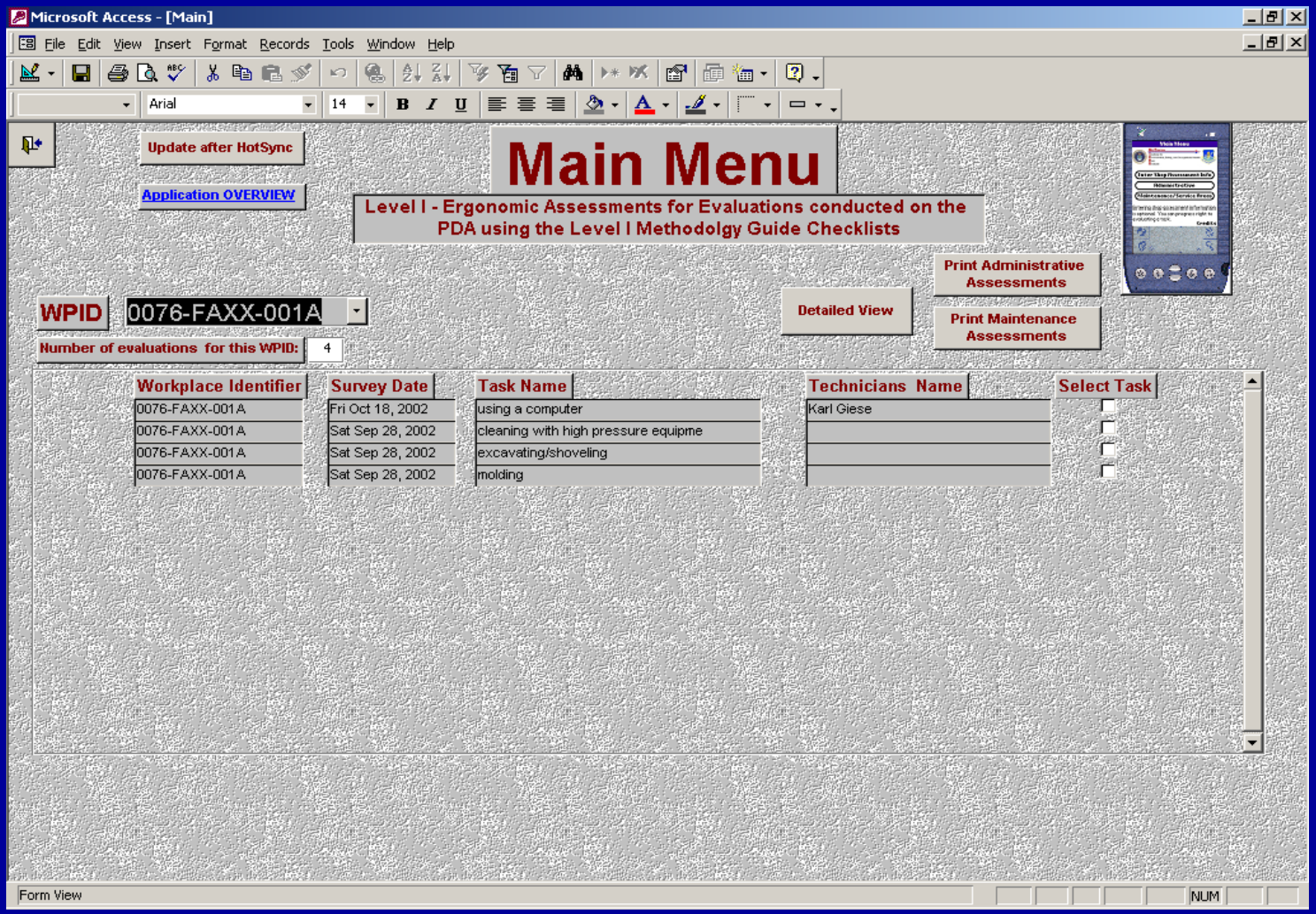
Desktop Application

Individual Assessments



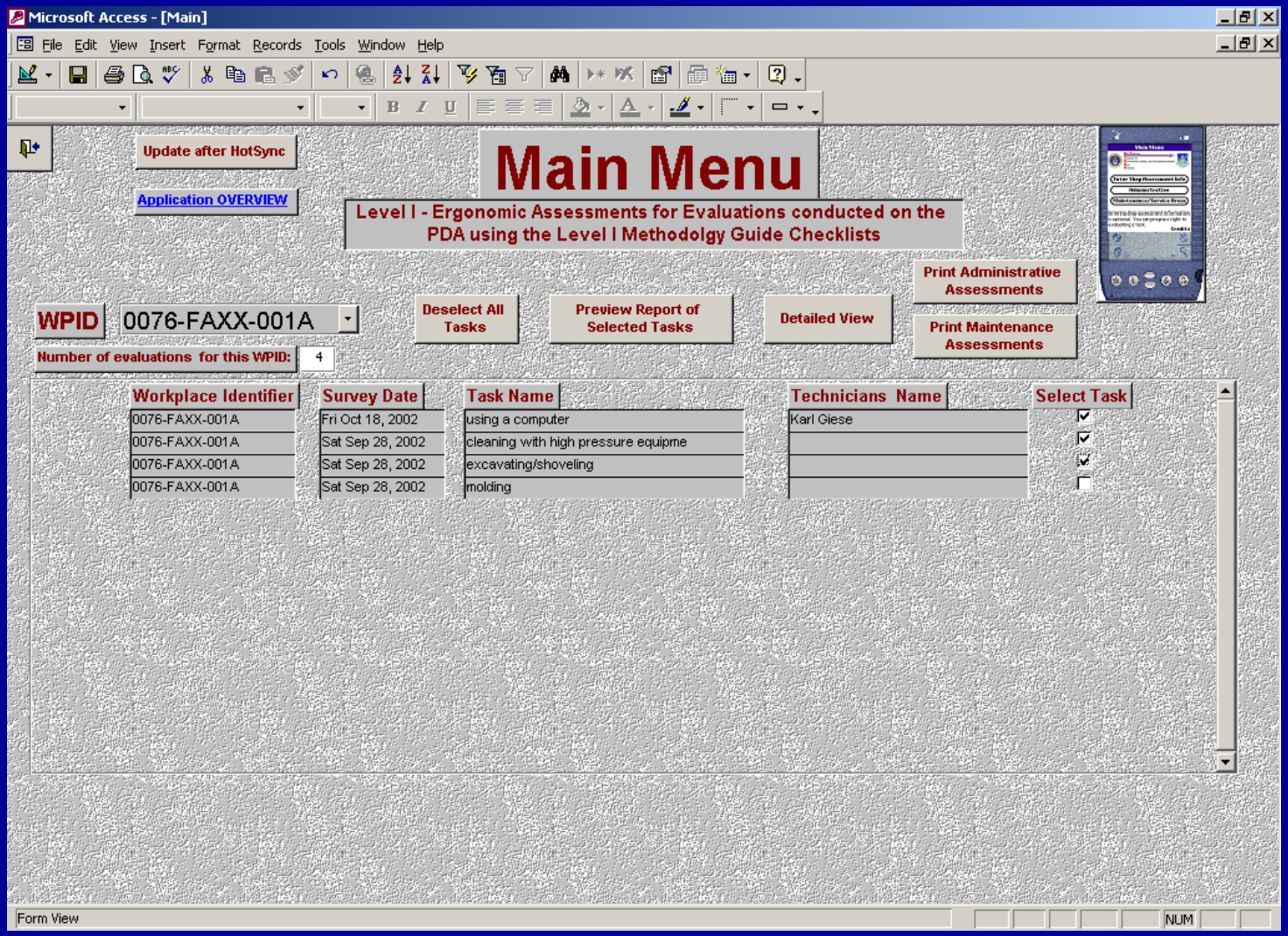
Desktop Application

Condensed View of Assessments



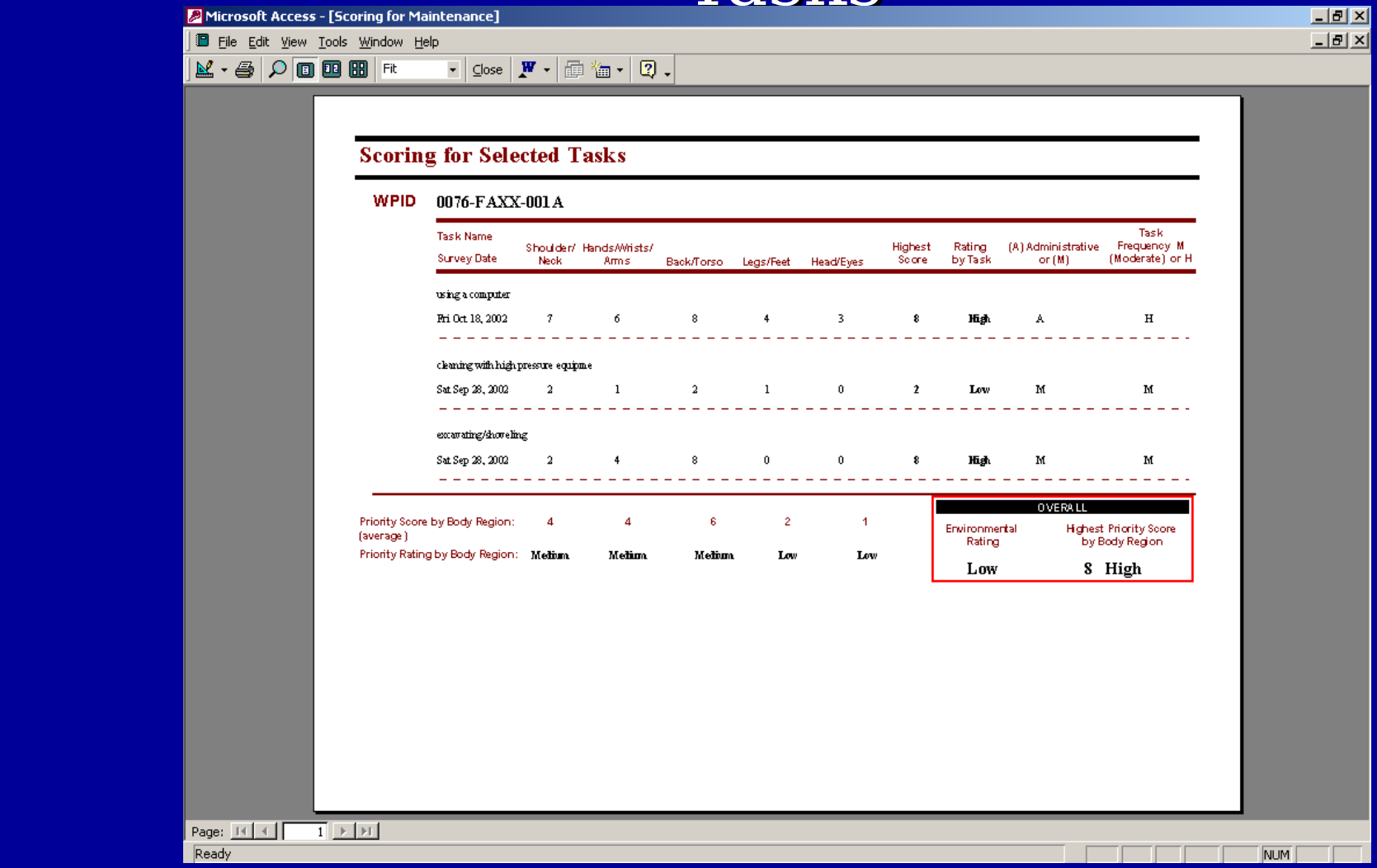
Desktop Application

Condensed View of Assessments



Desktop Application

Scoring Summary for Selected Tasks


Microsoft Access - [Scoring for Maintenance]
File Edit View Tools Window Help
Fit
Close
Scoring for Selected Tasks
WPID 0076-FAXX-001A
Task Name / Survey Date | Shoulder/ Neck | Hands/Wrists/ Arms | Back/Torso | Legs/Feet | Head/Eyes | Highest Score | Rating by Task | (A) Administrative or (M) | Task Frequency M (Moderate) or H
using a computer
Fri Oct 18, 2002 | 7 | 6 | 8 | 4 | 3 | 8 | High | A | H
cleaning with high pressure equipme
Sat Sep 28, 2002 | 2 | 1 | 2 | 1 | 0 | 2 | Low | M | M
excavating/shoveling
Sat Sep 28, 2002 | 2 | 4 | 8 | 0 | 0 | 8 | High | M | M
Priority Score by Body Region: (average) | 4 | 4 | 6 | 2 | 1
Priority Rating by Body Region: | Medium | Medium | Medium | Low | Low
OVERALL
Environmental Rating: Low
Highest Priority Score by Body Region: 8 High
Page: 1
Ready
NUM

Future Enhancements

- Standalone, self-executable desktop application
- Level I Methodology Guide Checklists for handhelds running Windows CE
- Incorporate Job Requirements/Physical Demand survey data onto handheld
- Stable interface with Command Core

Air Force Ergonomics Website

For latest information on Air Force Ergonomics and tools, visit us at:

https://www.afms.mil/ergo